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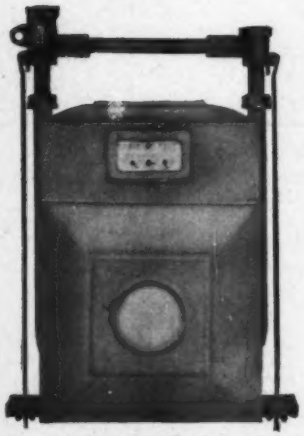
Two Styles
of
Meter Connections
(Both adjustable)

TIE-IN-BAR



No. 45A Tie-in-Bar Type Connection on Meter

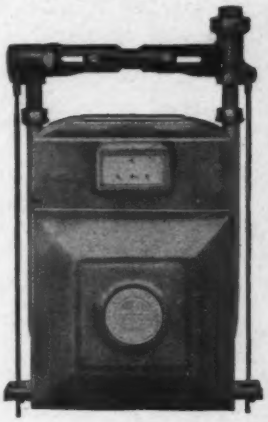
As a result of more than sixteen years' experience The Lattimer-Stevens Company has developed two separate and distinct types of meter connections, different in construction, but both having in common the adjusting features.

The connection on the left is our latest development in light tie-in-bar connections and contains the new half-round bar feature which allows adjustment to variations in the alignment of meter screws.

The connection shown at the right is our standard overlapping bar type of connection and is used largely by gas companies throughout the country. This connection, after being adjusted to the meter, becomes a rigid protection for the meter.

The Lattimer-Stevens patented shelf affords added support for the meter and prevents strains from sagging house lines and leaks from washer shrinkage. L-S connections can be furnished with or without built-in stopcock and in styles to meet every meter setting requirement.

OVERLAPPING BAR



No. 2 Overlapping Bar Type Connection on Meter

Write for Samples and Prices

The Lattimer-Stevens Company

Company Member American Gas Association

72 Yale Avenue **Columbus, Ohio**

New England Representative:
The Eastern Service Co.,
Boston

New York Representative:
Mulcare Engineering Co.,
100 Park Place, New York

Pacific Coast Representatives:
Will W. Barnes, Los Angeles
A. P. Bartley, San Francisco

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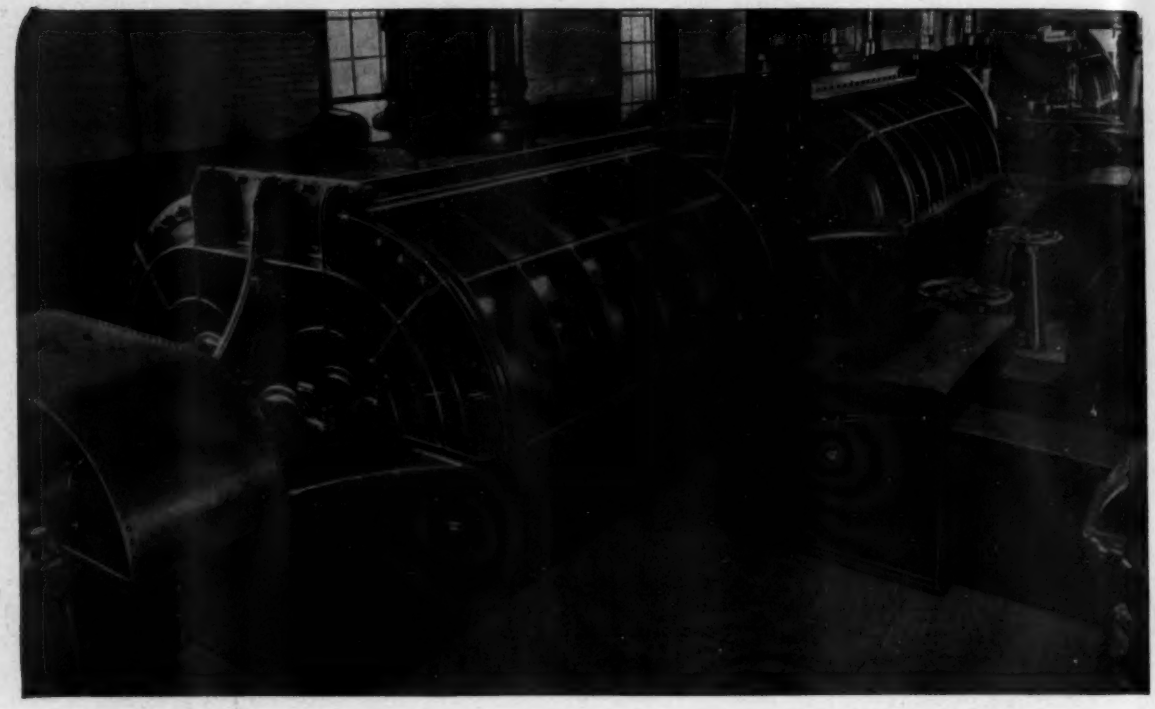
ROOTS



Installation of Roots Low Pressure Blower used to furnish air to Water Gas Sets at Plant of Public Service Gas Co., Paterson, N. J.

Save 25% of the Steam by Installing a ROOTS Blower for Your Water Gas Sets

A high quality Turbo Blower requires 400 H. P. to deliver 40,000 cubic feet of air per minute at 42" W. G. The Roots Rotary Positive Blower requires but 300 H. P. to deliver the same volume of air at the same pressure.

Increase the Make of Your Set 30%

In addition to the great power saving, better operating conditions are noted. It is natural to expect this because the necessary volume of air is forced through the fire regardless of clinkers. At one plant in which a Roots Blower replaced a fan, the superintendent estimated an increase in make of thirty per cent. An increase in make of gas can be expected, especially where an old-style fan is replaced by a Roots Blower.
Bulletin 101 contains more specific data. Write for it.

The P. H. & F. M. ROOTS CO.

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NEW YORK
120 Liberty Street

AMERICAN
GAS JOURNAL

Vol. 121. No. 10 NEW YORK, SEPTEMBER 6, 1924 Whole No. 3480

The Evolution of the Pretzel

Reading bakery uses almost 5,000,000 feet of gas annually to bake the knotted biscuit

J. Calhoun Smith

Commercial Agent, Consumers' Gas Co., Reading, Pa.

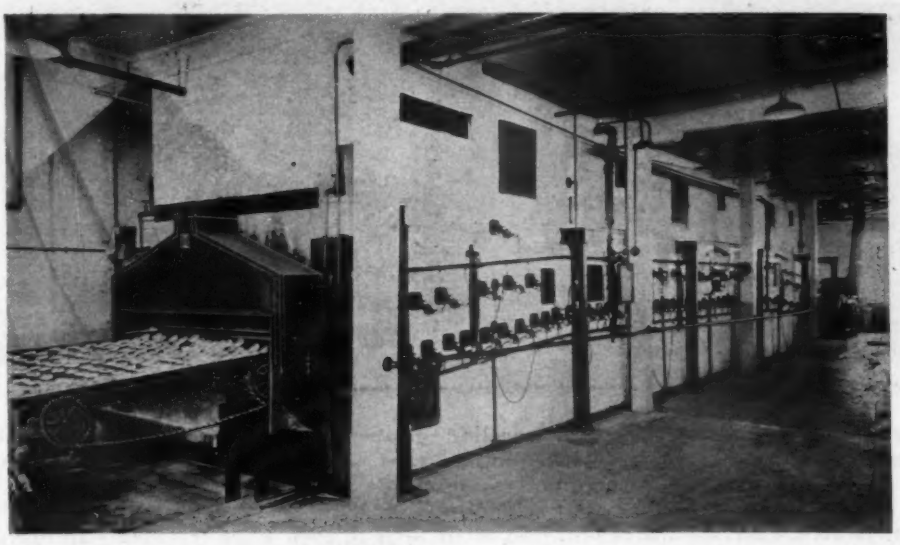
TWO HUNDRED THOUSAND pretzels every day—more than sixty million every year. That is the product of the Nistle Bakery in Reading, Pa.—"The Pretzel City."

Placed end to end the year's production of this bakery would make a pretzel trail extending from Reading to Los Angeles, Cal., and then some hundreds of miles into the Pacific Ocean. On the east it would extend across the Atlantic and far into Germany, the land that gave the pretzel birth. On the south it would extend into South America to the Amazon River and on the north to the Arctic Circle. In pyramid form they would make a structure that would rival the Pyramid of Cheops.

The home of the Nistle pretzel is a large, well lighted, well ventilated building that in every respect contains the last word in the matter of pretzel-making appliances, some of which are the outcome of original ideas of Frank P. Nistle, "The Pretzel King," owner of the famous bakery.

How the Pretzels Are Baked

The evolution of a pretzel is an interesting process from start to finish. The first step is of course the mixing of the dough. No single brand of flour contains all that is essential to the making of a perfect pretzel and the blended flour used for Nistle pretzels is the outcome of much experiment.



More than sixty million pretzels a year are baked on this gas-fired traveling oven at the Nistle Bakery, Reading, Pa. Note pretzels entering oven on conveyor

After the dough is mixed it is fed into a machine that with uncanny and unfailing accuracy picks

up just enough to form a pretzel and throws it upon a revolving belt in the shape of a thin dough rope about ten inches long. On either side of this revolving belt stand girl operators with wooden trays. A rope of dough is taken from the belt and with a deft manipulation or two, far quicker than the eye can follow, a pretzel is formed and placed upon the tray. This is the sole operation in which the pretzels are touched by hands. A rope of pretzel dough is a cranky, erratic thing that is not amenable to machine discipline. It has been tried but with indifferent success. The deftness of the girl operators in shaping the pretzels, all of which are exactly alike, is little short of marvelous. Some of them have a record of more than thirty a minute.

After the pretzels are formed they are placed for a short time on a drying rack and from there they go to the gas-fired traveling oven in which they receive their baptism of fire. Before entering the oven, however, the pretzels are placed on a belt from which they fall into a bath of sal-soda, which gives them their color. Operators on either side of the oven rescue them from the sal-soda bath with long sticks and place them on the oven conveyor. They then receive the proper salt apportionment and of their own volition enter the oven.

The Bake Oven

This oven is the mastodon of all ovens, fifty feet long, six feet wide and fifteen feet high. It contains sixty-three burners that operate at a maximum consumption of three thousand cubic feet of gas per hour. As heated with Consumers Gas Company's gas, the Hebrew children would have had at least a perspiring time in this mammoth affair, the exterior of which is lined with a bewildering array of thermometers and heat regulators by which the temperature can be controlled at any point to a fraction of a degree.

1. Battery of coal-fired ovens replaced by traveling gas-fired oven. 2. Mixing room where the pretzel dough is mixed by modern machinery. 3. Another view of the traveling oven. 4. Discharge end of oven where pretzels drop into wire receptacles

The oven alone represents an investment of $65,000. It is of a standard type of traveling gas-fired oven. The conveyor travels through the oven in from nine to twelve minutes and the pretzels, baked to a golden brown, all exactly alike and giving off an appetizing aroma, tumble in a cascade into wire receptacles. After two hours in a dryer they are ready for packing.

Consumption of Gas

The gas-fired oven displaced a battery of four

(Continued on page 820)

The Activities of the Canadian Gas Association in 1923

The address of the president, C. A. Jefferis, at the 1924 convention

SINCE presidential addresses are not in my line, being far removed from the life work of a practical engineer, it will be quite excusable if I confine myself to summarizing the activities of the association during the past year, a year comparatively uneventful so far as any great changes are concerned in the Canadian gas industry.

When the association chose to elect me as president for the year, I think you all understood that it was not my desire to seek this limelight position, and I told you at the time that you would have to accept the responsibility of placing me in this office; and if you had seen your way to select someone more capable for the position, you would not now be burdened with this address.

The Membership of the Association

It is gratifying to note that we have now a membership of 25 active gas company members, embracing nearly all of the artificial gas companies in Canada, 36 employee or Class B members, 74 Class C or associate members, and 3 honorary members—making a total of 138 members, an increase of 10 as compared with a year ago.

It is my hope that all who attend this year's convention will benefit by their attendance, and that profit and pleasure will result from our deliberations.

Activities During Year Light

As I have stated, our activities during the year have been somewhat light. We have been called upon to supply a considerable amount of information to local companies, and have had considerable correspondence to attend to, but so far as large or nationally important matters are concerned, there is very little to report.

It is gratifying to know that Canadian gas companies are anxious to respect the law in regard to the calorific standards for gas, and your executive would urge that all companies do their utmost to keep well above the minimum standard.

Mr. E. A. Hills, who has been acting secretary of the association since the retirement of Mr. G. W. Allen in 1922, found it necessary to retire from that position on October 1, 1923, on account of having accepted a position as manager of the Barrie Gas Company. As the services of Mr. Allen were again available, your executive committee unanimously decided to reappoint Mr. Allen to the position of secretary of the association, and I have no doubt this will meet with the hearty approval of the members.

Gas Business Good

Notwithstanding the general business depression during the past year, the output of gas has been most gratifying, many companies showing substantial increases. A great development in the use of gas for industrial purposes is the principal matter of interest to be reported, and I believe that it is in this direction that the future is most promising. Some of the larger gas companies have found it necessary to make very substantial additions to their generating plants and distribution systems to meet the constantly increasing demand for gas. In this connection we will have the pleasure of listening to two well-known industrial gas men, Mr. Frank F. Cauley, manager industrial fuel department, Peoples Gas Light and Coke Company, Chicago, and Mr. H. E. G. Watson of Toronto. These gentlemen will speak on the industrial fuel situation in general.

Prospects for Future

The prospect of the gas industry for the future is a very bright one, and it will be for each gas company to prepare itself by close study at their local situation, to meet the demands which are likely to be made upon them for gas as fuel.

A. G. A. Thanked

In closing, may I express the heartiest appreciation of the active co-operation which our association has received from the officers and directors of the American Gas Association, with whom we are affiliated. Many vital matters pertaining to the gas industry, which that association has been studying, and the results of which it has always been pleased to extend to us in Canada, have been of great assistance to our association and to the members of the association. I therefore desire, on behalf of the members of the Canadian Gas Association, to extend our thanks to the American Gas Association for its interest in our affairs and for the assistance which it has rendered to the gas industry as a whole.

Little Jobs Taken On with Profit

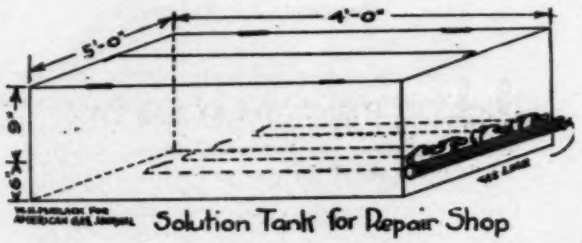
Gas plays a big part in the automobile repair business and in service stations

William H. Matlack

THE salesman who is desirous of developing his territory should keep his eye on the automobile repair and service shops. These shops offer many opportunities for small gas installations. Any shop where motor bearings are re-babbitted is a prospective user of gas. Battery service stations use small gas torches, soldering furnaces, and when you locate a station where radiators are repaired,

you will find a prospect for a gas-fired solution tank, such as is illustrated below. This tank is used to remove the grease and sediment from the radiator before it is repaired and it is also used for the same purpose after the radiator has been put into shape and when it is ready for mounting.

The tank, illustrated below, holds approximately 112 gallons of solution, which is about the amount the average small shop requires. The four burners are 48 inches long and are drilled with two rows of



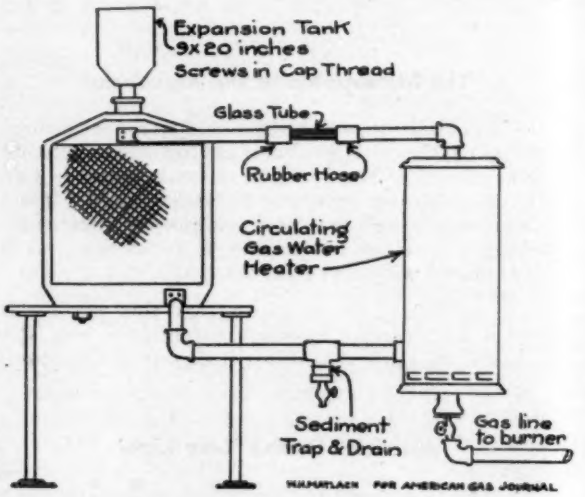
Solution Tank for Repair Shop

one-sixteenth holes at three-eighths centers. The burner is set about three-quarters of an inch below the bottom of the tank. The gas consumption per burner (570 B. T. U. gas, 5-inch W. C. pressure) is 106 cubic feet per hour.

Hot Water for Radiators

The accompanying illustration shows another small industrial installation that can be made by any gas appliance salesman who will take the trouble to present his ideas to the service station man. The installation illustrated is used by H. Paulman & Company, Chicago, Ill., and consists of a circulating gas water heater, an expansion tank, a small piece of glass tubing, a drain cock and a few feet of hose. In speaking of the installation, Edgar Gardner, service manager for the company, said: "There is very little detail in connection with the installation of our system for boiling out radiators. We purchased an ordinary hot water heater such as is used in the household kitchen, for heating a 30-gallon tank.

"There is only one feature that might be considered a detail, and that is the installation of the glass tube. This should be installed in such a way that it would be protected from cold drafts. This glass tube is necessary so that the condition of the liquid used in the boiling process can be noted. If it gets black and thick in a short time, it is good policy to



drain it out and put in a fresh solution. It also shows the water circulating so that it can be readily seen whether the system is operating. The rapidity of circulation of the solution shows the operator whether the radiator is being 'freed up' in a reasonable time.

"The expansion tank shown is made of galvanized iron fitted with a spout that is threaded and screws onto the filling spout of the radiator. This tank is necessary to take care of the expansion of the fluid as well as the rise in the top of the radiator due to the core being clogged when the process is first started. As the radiator starts to 'free up,' the solution does not rise as high in the expansion tank as it does when the operation is first started."

The sketch clearly outlines how this installation is made and any gas appliance salesman should be able to sell it to seven out of ten service shops.

(Continued on page 820)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 36

Expansion Effect of Heat (continued)

Change of Volume of Gases With Pressure

While it is possible to compress liquids and solids to a very slight extent, these states of matter are commonly known to be incompressible. In fact, the principle of the hydraulic press depends on the fact that water is incompressible. When pressure is exerted on a body of water, this pressure is transmitted throughout the mass of the same in all directions. Hence it is uncommon to speak of volume change of solids or liquids due to pressure.

On the other hand, the volume of gases are singularly affected by the pressure. As the pressure increases, the volume decreases, and as the pressure decreases the volume increases. In other words, the relation between the volume and the pressure is just the reverse of that between the volume and the temperature.

It is accordingly very important in dealing with gases, whether one is concerned with determining their volume, or their calorific power, or their density, or their specific heat, or, in fact, any of their physical properties which are dependent on the volume in one way or another,—it is essential under these conditions to ascertain accurately the temperature and the pressure of the gas when the determination of its physical property was made.

Definition of Standard Condition

Inasmuch as the volume varies constantly as either the temperature of the pressure of the gas or both are varied, it is necessary to have some standard on which volumetric measurements and determinations of physical properties may be based. It is accordingly customary to reduce the volume in each and every case to standard conditions, namely, atmospheric pressure or 30 inches of mercury and 60 degrees F. While the standard pressure is always written as 30 inches of mercury, the standard temperature may vary. Sometimes it is 60 degrees F., corresponding to 15 degrees C.; and then again it is zero degrees C. or 32 degrees F. In the calulation of gas volumes, referring to the gas with which the gas engineer is primarily concerned, the standard temperature is commonly set at 60 degrees F.

Boyle's Law

The law which connects the volume of gas with the pressure is known as Boyle's law. It simply states the volume of a gas varies inversely as the pressure or in other words that the product of the pressure and the volume is a constant at any temperature.

Thus if P(a) is the pressure of a gas at the temperature T, corresponding to a volume V(a), and if P(b) is the pressure at the same temperature T, corresponding to another volume V(b), then the following relation is true:

$$\frac{P(a)}{P(b)} = \frac{V(b)}{V(a)} \text{ or } P(a)V(a) = P(b)V(b) = a \text{ constant.}$$

TROLLEY HELPS TO LAY GAS PIPE

Occasionally the laying of gas main is quite difficult, due to other construction work under way in the street. Recently in Philadelphia such a job was disposed of quickly by enlisting the aid of the trolley company. Portions of several streets were being graded and the trolley tracks relocated. A 12-inch main was to be removed and replaced by a 20-inch main, using the same trench, the work to be done in a fixed time. When it came to delivering the necessary 39 lengths of 20-inch pipe it was found that the condition of the roadway was unsafe for truck operation.

Arrangements were made to have the pipe loaded on a work car of the traction company and unloaded as required along the trench. The cost of the trolley work car averaged $1.50 per short ton of pipe. It was necessary to haul the pipe to the car by truck, so the hauling cost of this job was somewhat higher than it would have been using a truck only. But the new main had to be laid without delay, and that was accomplished.—U. G. I. Circle.

*The Industrial Gas Situation

The important factors controlling development in industrial gas

F. F. Cauley

Manager, Industrial Gas Sales, The Peoples Gas Lig ht & Coke Company, Chicago, Illinois.

AT this time, when most of us are discussing financial and industrial conditions, it might be well for us who are in the gas business, to turn our attention to a subject upon which the financial issues of our business are vitally dependent, namely, the promotion of industrial gas sales.

In analyzing the industrial gas situation, it is interesting to note that while gas has been manufactured and sold in the United States since 1816, statistics show that in 1911 about 5 per cent of the gas sold was for industrial purposes, while in 1921 the sale of industrial gas reached a point of 25 per cent of the total gas output in our country. This is certainly a substantial and encouraging increase. It has greatly helped to raise the total gas sales in the United States from 159 billion in 1911 to 326 billion cubic feet in 1921.

Expansion Lies in Industrial Fields

These figures show that the gas business has been keeping in step with other progressive industries. It has changed almost entirely from a gas lighting to a fuel or heating business, therefore the present analysis shows clearly that the heating field, industrially and otherwise, offers the greatest opportunity for expansion.

Publicity a Great Need in Industrial Gas Business

One of the foremost and successful utility men in the United States recently stated that what the gas business needed most was wider publicity and more aggressive sales work. To my mind, this statement is the nucleus of the situation. The gas business certainly does need greater publicity. I refer, of course, to advertising the advantages of gas for industrial, commercial and domestic uses. Some money has been spent on the domestic end of the business, and, I might add here, it has produced most excellent results; but we have now reached a point where we should advertise the industrial gas business extensively. If the managers of gas properties would stop and consider the large amount of revenue to be gained from industrial gas sales, they would not hesitate to make suitable appropriations in their annual budget to secure this very profitable business.

Industrial Gas Publicity in Chicago

For several years in Chicago we have advertised gas for industrial purposes.

Articles are prepared for daily newspapers and for at least ten local and eight national publications which we know our customers and prospective customers read.

Direct-to-customer literature is sent out at specified intervals.

Industrial advertising is also extended to billboards, elevated railroad platforms, gas holders, fences, and other gas company property.

Advertising Must Be Educational

I believe we have at least made a start in our industrial advertising campaign. There is still a big task ahead of us, for we feel that selling manufactured gas for industrial heating purposes is in no sense a merchandising problem; it is purely a matter of educating the men in the industries, so that they will realize the value of gas fuel. I cannot emphasize too strongly the necessity of advertising and educating the public on the new uses of industrial gas.

How the Electric Interests Are Advertising

I believe it is unfortunate that the gas companies have not advertised their business in the same manner as the electric people. There is no good reason I can see for this, but it is a fact that all phases of the electric business have been advertised very extensively. "Do It Electrically" has been the trade slogan for several years, until now the manufacturing concerns themselves advertise that their product is made by electricity. By persistent advertising, the electric people have actually got manufacturing firms to advertise the electric business. In some figures recently quoted by the president of the Public Utility Advertising Association, he stated that the appropriation for electric light and power advertising in 1924 was 50 per cent over 1923, while the appropriation for advertising by the manufactured gas companies over the same period was but 16 per cent. It seems to me that we should lay plans immediately for more extensive advertising. This could be done through every local gas company and also by the state and national gas associations.

Results of Advertising Twofold

Remember that advertising and greater publicity accomplish two things: they educate the people within our own companies and the general public at the same time, and when you can bring this about, you are bound to popularize our product and thereby build up our business.

(Continued on page 825)

* Paper read before the Canadian Gas Associati on meeting at Toronto, August 28-29.

As The Journal Views It

HOME SERVICE AND GAS SALES

One of the latest additions to the gas company organization is the Home Service Department. Despite the success that has characterized this new development, there are still comparatively few gas companies that have seen fit to include such a department in their organization. The question, as to whether such specialization in service work pays, is still an open one in the minds of many gas men and gas companies. There are many still not sold on this proposition, for they have not yet been convinced that tangible benefit is derived by the gas company through the operation of such a department.

In a recent issue of the American Gas Journal, a pioneer in this work described the results obtained through the Home Service Department of one of the largest gas companies in the United States. What he had to say there is of prime importance and of decided interest to those individual gas men and to those gas companies that are still on the fence in regard to this proposition. The matter is of such importance that it is being stressed here in detail.

Those gas men who do not yet believe in Home Service work and those gas companies who also share in this belief have perhaps not had the opportunity to make a study of the matter or else it has not been presented to them in the light that it should be. If careful consideraion is given to this proposition and if a close analysis of the workings and results obtained from Home Service is made along the lines which are indicated in the aforementioned article, then there can be just one conclusion.

Home Service is unquestionably a profitable undertaking for any gas company. Not only is it of value in, what may be called, an intangible way in the creation of good will or the fostering of a spirit of friendliness amongst the customers of the gas company, but it is also fraught with actual tangible benefits. Of course, there is no question at all that anything the gas company does to promote good will amongst the public, that it serves, is of value to it. But this may be one of abstract character only and it is hard to tell what particular act of the gas company is of outstanding effect on the creation and maintenance of good will in the community. The gas company does a great many different things for its customers and they all sum up to form a force for good will. Sometimes it is the most ordinary act on the part of a gas employee that is most potent in winning over a dissatisfied customer and making out of him a friend for the gas company.

But in the case of Home Service, while it benefits the gas company indirectly in the manner just described, nevertheless it has a direct relation on gas sales. It has been stated and substantiated that Home Service increases gas sales. Home Service is simply helping the housewife to maintain a comfortable and attractive home. In doing this it has a function which is of transcendental importance in modern society, for the home is the cornerstone of our civilized life and anything that tends to promote the welfare of the home is and should be of interest to all.

The Home Service Department shows the housewife how better to cook her food, how more attractive to make her meals, and it also goes out of its way to help her in many different ways to solve her domestic problems, at times even if they have no direct relation at all to gas. It promotes the return to the home-cooked and home-served meals and in doing so it naturally has the effect of increasing the quantity of gas consumed in the home.

As far as popularity of the service is concerned, there seems to be absolutely no question. The use of the radio in conjunction with other means will enable the Home Service Department to reach directly everybody in the community served with gas. Everybody seems to be vitally interested in what the Home Service Department has to offer. The courses in cooking in the use of gas are well attended. Taken in the broad aspect there probably has been no one undertaking that the gas company has interested itself in that has attracted so much favorable comment as Home Service.

And the results have been worth while. It is not an undertaking that benefits just the gas customer. The gas company itself can well justify the expense entailed by the Department by the good will and friendly spirit that Home Service engenders among the gas customers and more particularly perhaps and more explicitly by the increase it effects in gas sales.

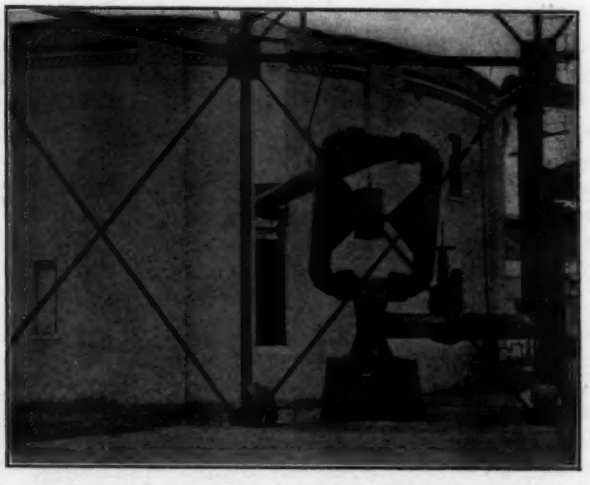
THE EVOLUTION OF THE PRETZEL

(Continued from page 814)

coal-fired ovens built less than four years ago at a cost of $17,000—another illustration of the almost universal adoption of the sanitary and ideal fuel by bakers. The gas consumption for the past six months on this oven has been as follows:

January	392,200	cubic	feet
February	370,100	"	"
March	410,000	"	"
April	391,200	"	"
May	390,500	"	"
June	373,800	"	"
Six months	2,327,800	"	"

The traveling gas-fired pretzel opens a new field for the gas man. I know that a great many cities have pretzel bakers and if they can be shown that this type of oven does a great deal more work at a lower cost (and they can be shown) I am sure they will quickly adopt it.



This picture, taken from the 1,000,000-cubic-foot gas holder, shows the grasshopper connection recently installed to get gas more rapidly from the gas-making machinery to the relief holder. The new pipe connects into the top of the holder, and moves up and down with the holder.

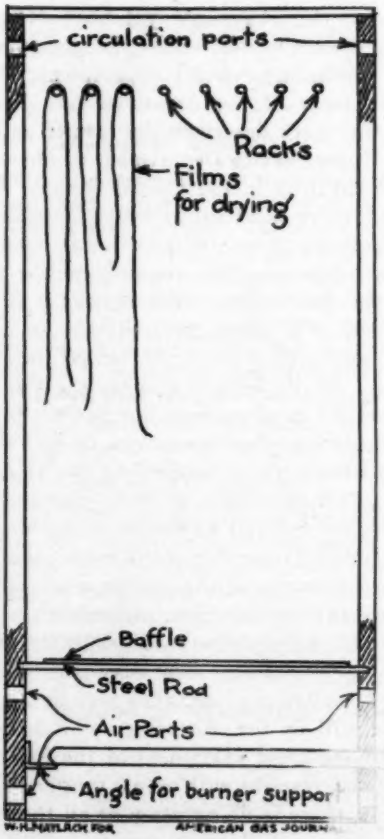
LITTLE JOBS TAKEN ON WITH PROFIT

(Continued from page 816)

The solution used is usually concentrated lye or an Oakite solution. In all cases care should be used to instruct the user of such installations carefully to wash out all solutions before completing the job on the radiator.

Find the Film Company

If there is a film development company in your city go to them and sell them a drying cabinet such as is illustrated here. This cabinet was designed by W. F. Eve, Jr., superintendent of the distribution department of the Gas Light Company of Augusta, Ga. The sketch tells the story. The only detail not shown is that the whole lower two-thirds of the cabinet was asbestos lined and that the pipe racks for holding the films were so arranged in slots as to be easily removed. These racks were galvanized to insure against rust. The burner in this installation is a drilled pipe burner made in the company's shop.



Film Drying Cabinet

Catechism of Central Station Gas Engineering in the United States

Installment No. 36

(Continued from Last Week)

Anything beyond this, such as is shown on Fig. 2, is wrong, as is also a perfectly straight wick. When the conditions are as noted above, the flame will be smooth on the edge and of good shape, and the consumption of sperm will always come within the prescribed limits of 114 and 126 grains per hour. If they are not obtained after the candles have been allowed to burn for a sufficient length of time, the candles are at fault and should not be used. Some candles will not get into good condition until they have been burned for a long time, but a candle that has not reached the proper condition at the end of an hour's burning is probably worthless.

Care of Candles Not in Use

When candles are not in use they should be carefully protected from dust, since if they are allowed to become covered with dust this is drawn into the wick as the sperm melts and interferes with the flow of the sperm to the flame, thus interfering with combustion and preventing the candle from giving the proper amount of light.

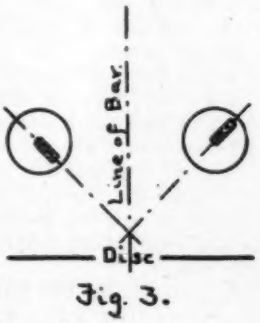


Fig. 3.

The position, with reference to the photometer disc and bar, of the planes containing the center lines of the wicks is also of importance in securing accurate results. The only instructions that are usually given are that the planes of the two wicks should be at right angles to each other, but, as pointed out by Mr. John Methven, these planes can occupy a number of positions with reference to the bar and disc while maintaining the required position relative to each other. The proper position is that in which each wick is at an agle of 45 deg. with the line of the bar, one pointing towards both bar and disc and the other pointing away from both bar and disc, as on Fig. 3.

It is also necessary that the candles be burned in a well ventilated space free from drafts, and that the time taken for burning forty grains of sperm be accurately determined, but these are questions concerning the design of the photometer room and the accuracy and sensitiveness of the candle balance which need not be discussed in this connection.

Much information as to the causes that affect the amount of light given by standard candles and the proper way in which to handle them to obtain uniform and accurate results is to be found in a paper on Photometry, by Mr. John Methven, American Gas Light Journal, December 9, 1889, and in an article entitled "The Standard of Light," by Walter Grafton, Journal of Gas Lighting, Etc., Vol. LVII, pages 690, 789 and 889.

Secondary Standards of Light

199. Name and describe one or more of the secondary standards of light that are used in this country to replace candles in determining the candle power of gas.

Ans. The secondary standards of light that are most frequently used in this country to replace candles in determining the candle power of gas are the Edgerton Standard and the ten-candle power Pentane Lamp.

The Edgarton Standard

The Edgarton Standard is formed by surrounding the 7 in. × 1¼ in. chimney of a Sugg D Argand burner with a blackened brass sleeve 2 in. in diameter, and thus cutting off from the photometer disc all the light given by the burner flame except that portion which passes through a horizontal slit in the sleeve. This slit is 13-32 in. high, has its lower edge ⅞ in. above the top of the steatite ring forming the burner tip, and extends a sufficient distance around the circumference of the sleeve to make it certain that it will give an opportunity for light to reach the disc from the full width of the flame. Directly opposite this slit on the other side of the sleeve another slit of the same size is cut out to prevent any light being reflected from the interior of the sleeve to the disc. A vertical slit running out of the horizontal one just mentioned is also made in the back of the sleeve to form an opening through which the height and appearance of the flame can be observed.

The Theory of the Standard

The theory of the standard is that when the burner is kept in good condition and the flame is adjusted to a height of 3 in., a constant amount of light will

pass through the slit in spite of variations in the quality of the gas supplied to the burner as long as these variations are not greater than would ordinarily be met with in the supply from any one works. It has been found by experiment that this standard shows the most constant value when the axis of the flame is set 3/8 in. farther from the middle point of the bar than normal; that is, when the axis of the flame lies 3/8 in. behind the plans passing through the plumb lines marking the position of the standard light. The value of the standard is of course not the same when used at different works with entirely different qualities of gas, but once standardized by a series of observations against candles at any works, its value may be assumed to be constant unless extraordinary variations occur in the candle power of the gas supplied. Mr. Rollin Norris, in a paper on "Some Experiments with the Edgerton Standard," read before the American Gas Light Association at the meeting held October 18, 1899, states the following conclusions as the result of a number of tests made with coal gas and carburetted water gas of different qualities:

Conclusions Drawn from Experiments

"Referring to the Edgerton Standard in its present design, the general conclusions to be drawn from the experiments which I have detailed above are that with water gas the value of the Edgerton is independent within wide limits, of the candle power of gas used in it; that with coal gas the value varies with the value of the gas burned, the change being about 10 per cent of the change in value of the gas used; that with either coal gas or water gas, if the Edgerton be carefully standardized for the conditions under which it is to work, it may be relied upon to give results whose error will not exceed 1½ candles, while a large majority of the observations will be correct to within one candle of the value of gas."

Some experiments reported by Mr. Alten S. Miller for the Research Committee of the association show that when an Edgerton Standard was not touched after being standardized, the maximum variations under working conditions between its values as determined against candles at different times did not exceed 2.5 per cent, but that it was necessary to restandardize it if it was disturbed in the slightest degree.

Checking Manufacturing Operations

While the Edgerton Standard may be open to objection for photometrical work where extreme accuracy is required, it is very valuable for the purpose of making frequent candle power determinations to check the manufacturing operations at a gas works.

The ten-candle power Pentane Lamp in use in this country is a modification of the original Harcourt ten-candle Pentane Lamp, which was designed by Mr. A. Vernon Harcourt, and is the standard of light officially adopted by the London Gas Referees for the testing of the gas supplied by the three metropolitan gas companies. The Referees have adopted it as a primary standard of light, but in the United States it is used as a secondary standard.

Modifications in the American Lamp

The modifications in the American lamp consist in the use of a brass tube instead of a rubber tube to carry the mixture of air and pentane vapor from the saturator to the burner, and the insertion in this tube of a small pet cock by means of which the flow of the current of air and vapor can be started if necessary at the time the lamp is lighted, and of a micrometer cock by which the height of the flame can be regulated. All the other parts of the American lamp are the same in design and dimensions as the similar parts of the original Harcourt lamp.

As indicated above, the material burned in this lamp is air saturated with the vapor of pentane, pentane being a distillate produced from petroleum by rectifying gasoline in the manner set forth in the instructions of the London Gas Referees.

Construction of the Lamp

The saturator containing the pentane is a square box made of tin plate and is placed upon a bracket fastened to the top of the tube carrying the burner bracket and the chimney and the tube surrounding the chimney. On top of the saturator at each of the two front corners is fastened a stop cock, the one on the left being provided with a funnel and serving both for filling the saturator with pentane and for the air inlet, and the one on the right forming the outlet for the vapor-saturated air. On the inside of the top plate are fastened seven partitions, the lower edges of which do not quite touch the bottom, but are sealed in the pentane as long as this is maintained at the proper height. The partitions are so arranged that, when they are sealed, the air cannot pass directly from the inlet to the outlet, but is forced to travel back and forth across the box eight times, and thus becomes fully saturated with pentane vapor before it reaches the outlet. A glass window is provided in the front of the saturator to enable the operator to see the height at which the pentane stands and thus know when it is necessary to put in a fresh supply.

The brass tube connecting the outlet of the saturator with the burner rises a few inches above the outlet stop cock and then bends over and drops to a point opposite the bottom of the burner, where it makes a right angle turn and runs horizontally to the burner. It is provided with unions at each end to enable it to be easily disconnected, with a pet cock in the bottom outlet of the tee by which the turn to the burner is made, and with a micrometer cock, by which the height of the flame is regulated, on the horizontal run next to the burner.

The Burner

The burner is an argand burner with a steatite ring having an outer diameter of 0.945 in. and an in-

ner diameter of 0.551 in. and containing thirty holes, each 0.049 in. in diameter. The supply of air to the outside of the flame is regulated by means of a conical hood, which also acts as a screen to hide the flame except on the side toward the disc, and that to the inside is furnished by means of an outer tube around the chimney tube in which an upward current of air is induced by the heat of the chimney. This current passes from the top of this outer tube into a box which carries it across to the inside of the tube to which the saturator and burner brackets are fastened and then descends this tube to the hollow burner bracket through which it passes to the bottom of the burner and thence up inside of the ring to the flame. The burner is placed on the opposite side of the stand from the saturator and with the top of the steatite ring about 15½ in. below the bottom of the saturator.

The Chimney

The brass chimney tube is set, when the lamp is old, with its lower edge 1.85 in. above the top of the steatite ring. At the bottom of the chimney is a talc or mica window through which the height of the flame can be observed.

The chimney tube is surrounded by an outer tube for the purpose of supplying air to the inside of the flame as described above, the lower edge of this tube being about 2½ in. above the lower edge of the chimney. The bottom of the tube carrying the saturator and burner brackets and the outer tube and air box fits over the end of a rod and rests on a ring clamped to this rod which is mounted on a tripod having a leveling screw at the end of each leg.

Using the Lamp

When it is to be used the lamp should be placed on the photometer table and adjusted by the leveling screws and the ring on the stand so that the supporting tube is vertical, the top of the steatite burner ring is 0.93 in. lower than the center of the photometer disc, and the center of the ring lies in the line formed by the intersection of the plane of the plumb lines marking the position of the standard light and the vertical plane containing the axis of the bar. The chimney must then be accurately centered above the burner and set at the proper height above it. A wooden block 1.85 in. high is provided for setting the chimney at the right height, the adjustment being made by setting the block on the steatite ring and lowering the chimney until it just rests upon the top of the block without binding it.

Details of Adjustment of Lamp

After the lamp is properly adjusted the saturator is filled about two-thirds full of pentane. As pentane is very inflammable and gives off, even at comparatively low atmospheric temperatures, a vapor which is heavier than air and consequently falls through the air, the saturator must never be filled when the lamp is lighted, nor should any other light be brought near it when it is open. When filling the saturator the vapor tube should be disconnected from the outlet stop cock and this stop cock opened to serve as a vent for the air displaced. When the saturator is filled to the proper height the stop cocks should be closed and the tube connected.

Adjusting the Micrometer Cock

The micrometer cock is then closed and both stop cocks on the saturator opened full. (At temperature of 80 deg. F., or above, the pentane when under atmospheric pressure will give off vapor faster than it is required by the burner and the vapor will issue from the air inlet if this is open. Under these conditions the inlet cock must be kept closed to avoid the danger of having the vapor that would otherwise escape into the air ignite at the burner and cause a fire. The burner is then fed with pentane vapor unmixed with air, but this does not seem to affect the amount of light given by it.) The pet cock at the bottom of the tube is then opened to start the flow of vapor saturated air, the palm of one hand being held below the cock to note by the feeling of coldness produced at the point where the vapor strikes the skin whether a current exists. If the current is not started by the mere opening of the pet cock it can be started by placing the mouth over the opening and sucking. When it is started the pet cock is closed and the micrometer cock opened while a lighted match is held over the burner until the pentane lights. The flame should then be turned up until it nearly enters the chimney and the lamp allowed to heat up, as it will not be possible to make the final adjustment of the height of the flame until it has been burning for from twenty minutes to half an hour. The English regulations require the lamp to have been burning with the flame at nearly its proper height for at least ten minutes before a test is made.

The Final Adjustment

The final adjustment is made by setting the flame as low as it is possible to have it without having any part of the openings between the three tips forming its top show below the chimney. A good way to get the proper adjustment is to start with the flame a little low; that is, with the lower angles of the openings just showing below the chimney, and with the gas to be tested burning at the proper rate. The photometer disc is then set so that the illumination is equal on both sides, as in making a test, the pentane flame turned up a little, the disc set again, and so on. At first the turning up of the pentane flame will cause it to give more light and the disc will have to be moved toward the gas flame, but a point will soon be reached when the further turning up of the pentane flame causes it to give less light, as will be shown by having to move the disc away from the gas flame. The height at which the pentane flame is thus found to be giving the most light is that at which it should be adjusted, and it should be watched to see that it remains at this height throughout the test.

This Pentane Lamp has been found to be a very reliable standard, and after a little experience with it, it is much more convenient to use than candles. Each lamp must, however, be first standardized by an extensive series of observations against candles, or against another Pentane Lamp the value of which has been previously determined, as none of them give a light of exactly ten candles.

An illustrated description of the Harcourt lamp, giving the dimensions of all parts and also specifications of the manner in which the pentane is to be prepared and tested, can be found in the Proceedings of the American Gas Light Association, Vol. XVI page xxxix, in the American Gas Light Journal, Vol. LXXI. page 733, or in Progressive Age, Vol. XVII, page 519.

The Bar Photometer

200. Describe a bar photometer, such as is used for determining the illuminating value of gas by direct comparison of the light given by the gas with that given by standard candles.

Ans. The essential features of a bar photometer are a standard gas burner and a standard of light fixed at a definite distance apart, a graduated bar placed between the two lights with its longitudinal center line in the vertical plane passing through the vertical axes of the lights, a disc perpendicular to this plane and mounted in a box movable on the bar, a meter for measuring the rate at which the gas is consumed, a timepiece for measuring the time, and a balance to weigh the amount of sperm consumed by the candle flames during a test. Two pressure governors, one dry and one wet, a King's pressure gauge and a thermometer for determining the temperature of the gas at the meter are also parts of a fully equipped photometer.

Arrangement of Apparatus

All of the apparatus is mounted on a table of the proper length and of a height that will bring the centers of the lights and the disc, which should all lie in the same horizontal line, on a level with the eyes of the person making the test. Marks are placed on this table fixing, with the aid of plumb-lines suspended from a frame carried on the screens spoken of later, the position to be occupied by the vertical axes of the two lights when they are the required distance apart. This distance is usually taken as either 60 inches or 100 inches. A solid wooden screen extending across the full width of the table and painted a dull black is placed about 12 inches behind each light, and a similar screen, with an opening in the center large enough to allow the rays of light to reach the disc without any interference, is placed about the same distance in front of each light. The object of these screens is to prevent light from reaching the walls of the room and being possibly reflected back from them.

The Graduated Bar

The graduated bar extends the full distance between the two front screens and is supported by stands fastened to the table. As stated above, the center line of the bar must lie in the same vertical plane as the line drawn from the center of one light to the center of the other. It must also be set at such a height above the table that when the disc-box is mounted on it, the center of the disc will be in the same horizontal plane as the centers of the lights. The top edge of the bar should be beveled so as to avoid any reflection of light from this edge to the disc, and it is well to also bevel the side pieces fastened on the bottom to support the wheels of the sight box, and all these surfaces should be made a dull black for the same purpose. The bar is graduated according to the law of inverse squares, so that when a single candle is used as the standard of light the candle power of gas can be read at once from the pointer attached to the disc-box. If two candles are used, the readings must be multiplied by 2 to obtain the correct candle power.

The Leeson Disc

The disc most often used is that known as the Leeson disc. It consists of a circular piece of white paper with a star-shaped hole cut out of its center placed between two pieces of thin white rice paper. The disc so formed is then put between two pieces of glass, cut from the same sheet so as to be of uniform quality and thickness, and the whole combination put in the blackened metal disc holder and pressed tightly together by means of a wire split-ring sprung into a groove in this holder. The paper must be left perfectly smooth when the disc is in place. Attached to the back edge of the disc-holder are two small mirrors, one on each side of the disc, set with their surfaces at an angle of 60 degrees with the plane of the disc, so that an observer standing directly in front of the edge of the disc can see images of both its faces, one in each mirror. The disc-holder and mirrors are mounted in the disc-box or sight-box in such a way as to be easily reversible, so that either face of the disc can be turned toward either light as desired.

The Disc Box

The disc-box or sight-box is a rectangular wooden or metal box mounted on four wheels, which run on pieces provided for this purpose at the bottom of the bar, so that the box can be easily moved back and forth. An oval hole slightly larger than the disc is left in each end of the box, and in the face there is a sight hole, also oval, and about 6 inches long by 3 inches high, through which the reflections of the disc in the mirrors can be seen. A pointer is attached to the box with its point directly below the disc. This pointer passes over the scale on the bar and by means of it the candle power corresponding to any setting of the disc can be read.

(Thirty-seventh Installment Next Week)

THE INDUSTRIAL GAS SITUATION

(Continued from page 818)

Next to advertising, we should improve and build up our industrial sales orgnaization. I believe that gas companies should take a certain number of engineering graduates into their organizations every year, according to the size of their companies.

Universities—Valuable Source

Recently I asked a professor of one of the large engineering universities what industries were seeking graduates leaving college. He stated that one particular industry had asked for 150 graduates, another for 250, and still another 300, etc., while up to that time, about June 1, just before graduation, he had received only one request from a gas company for an engineering graduate. Evidently the gas companies are not keen about securing this class of men for their business. Personally, I think this is a mistake, for I believe we should encourage the young graduate engineer to enter the gas industry.

The Training of Industrial Gas Sales Engineers

In Chicago we have made it a point to take a number of graduates and train them for our sales work. We have prepared an Industrial Gas Engineer's Sales Course covering as completely as possible the following general headings:

(1) Manufacture and Distribution.
(2) Service, Meters and Interior Piping.
(3) Routine.
(4) Rate Schedules.
(5) Burners and Their Application.
(6) Combustion Systems.
(7) Competitive Fuels.
(8) Reports, Letters and Quotations.

This course covers a period of three weeks.

Immediately following each lecture, the men are taken to see various plants and gas installations which serve to illustrate it, and painstaking effort is expended to insure a thorough understanding of the subject matter under discussion.

Promotion Possibilities Excellent

As these men develop, they are advanced to junior sales engineers and later on to senior sales engineers, with the assurance that outstanding ability in any of the individual men will surely lead to a junior executive position, such as supervisor, and from there to superintendent, either in our own company or some one of the many rapidly developing Insull properties.

Working Methods

We believe the sales engineer should first make a complete report of the plant to which he has been assigned. When he has secured and tabulated all this information, he will then be in a position to install the proper gas equipment, figure comparative costs, etc. We have prepared a method of making a systematic analysis, which covers the following:

1. Name of Firm.
2. Address.
3. Name and Title of Person Interviewed.
4. Present Gas Consumption.
   Quantity of Other Fuels Used.
   Gas Consumption per Month to Be Gained.
5. Nature of Business.
6. List of operations requiring heat and kind of fuel used.
7. Systematic analysis of each of these operations for which a fuel other than gas is used, covering the following points:
   (a) Description of Appliances.
   (a) Method of Operation.
   (c) Cost Computation, covering:
      (1) Fuel.
      (2) Labor.
      (3) Storage Charges, etc.
   (d) Deduction of Final Cost per unit of Production.
8. Recommendations as to gas appliances, high or low pressure systems, or changes in equipment necessary if gas were substituted, including cost of equipment or changes.
9. Operation with gas.
   (a) Method of Operation.
   (b) Cost Computation.
   (c) Deduction of Final Cost per unit of Production.
10. (a) Straight-line diagram showing existing services; interior piping and meters in solid lines, and proposed extensions dotted.
    (b) Plan showing location of appliances in factory.
11. Cost of Extensions.
12. Conclusion.

Comparative Costs

A complete cost analysis should be made in every instance, because we have found that oil or coal bills compared with the gas bill mean very little. Our engineers work with the customers with this thought in mind, that it is not what the fuel costs, but what it costs to use it.

A little later, I will be pleased to show you on the screen a few typical cases which will illustrate this complete cost analysis.

Services of Metallurgist Essential

Selling gas for industrial purposes creates many problems. Steel treating and the heating of metal products are perhaps the largest uses for gas fuel. This naturally brings about metallurgical problems, and in order to meet this condition our company operates a metallurgical laboratory in connection with our industrial sales work. We employ a chief metallurgist and two assistants.

We consider the metallurgical work done by our laboratory, which has now been operating over a period of three years, has been a great assistance to us in selling gas for industrial purposes. I believe

that as more gas companies get into the big industrial business, the industry as a whole will appreciate the value of metallurgical work. Last summer I visited Europe, investigating industrial conditions in seven countries and twenty-six gas companies, and I was agreeably surprised to find metallurgical laboratories in several of the progressive gas companies who were pushing the sale of gas for industrial purposes. I refer to such cities as Birmingham, Manchester and Glasgow.

Memberships in Engineering Societies

I have always encouraged our sales engineers to become members of engineering societies, as the acquaintance and contact gained through these channels are often of great assistance in selling industrial gas. Our sales engineers are identified with and take an active part in such engineering societies as the American Foundrymen's Association, American Steel Treaters' Society, American Chemical Society, American Ceramic Society, and others.

There is generally a local chapter in all the principal cities throughout the country, which holds meetings once a month where papers are read and the members enter into discussion, which very often deals with heating problems, and it is then that the industrial gas engineer should educate the men in the industries of the benefits to be derived from gas fuel.

The contact gained in these meetings is an invaluable asset. There are also the annual conventions of these societies, which should be attended by the industrial gas engineers.

I would like to say a word regarding the relations between the industrial furnace manufacturers and the gas companies. In the first place, every sales engineer engaged in this industrial work should have in mind one thing, and that is to always install the very best equipment to be obtained, regardless of price. The equipment furnished should be the best made and the price should be considered secondary. One of the things that has retarded and has hurt the sale of industrial gas is that inefficient and makeshift furnaces have been installed in many cases just because they were cheap.

Sell Furnaces on Merit—Not Price

I believe the electric furnace companies should be an inspiration to the industrial gas sales engineer. Their thought is "How good can we build the appliance?"—and the price is always secondary. This is borne out by the prices they get for their electric furnaces. I dislike to say it, but I know from experience the average industrial gas salesman approaches the customer with a sense of fear when asking him to spend $5,000 or $10,000 for some special gas equipment, while the electric sales engineer would think nothing of asking the same customer double the amount.

Assist the Appliance Manufacturer

I believe the gas companies should change their policy when dealing with this industrial appliance business. In Chicago, we have adopted a plan of not making anything in the way of gas burning equipment. We believe that the appliance manufacturer should be called in and that he should furnish the designs, do the engineering work and submit prices for his best equipment. Our policy is to pay the appliance manufacturer for this part of the work, whether the sale is closed or not. In turn, the industrial gas sales engineer should sell the equipment to his customer. In this way, the manufacturer is being relieved of the burden of selling his product, and is consequently free to put all of his energies into the work of developing new and more efficient appliances. He is being strengthened in his financial position so that he will be able to make greater contributions to the industry.

The industrial prospect is also being taught to purchase gas equipment instead of using home-made appliances built in his own shop. He is also reaping the benefits of better utilization of gas, which you all agree is needed if we hope to take on the big business.

Summary

In this paper I have tried to briefly analyze the industrial gas situation, and in closing I have a few suggestions to offer, as follows:

(1) That the industrial gas business is our field for expansion.

(2) We should carefully analyze our budget and try to appropriate more money for industrial advertising.

(3) Gas companies should maintain a closer contact with engineering colleges to see that modern gas equipment is installed in the college laboratories and that the students are kept informed of the modern methods of gas utilization.

(4) Retain the services of metallurgists and chemical engineers, if necessary, in order to take over large industrial customers.

(5) Train your sales engineers to make a complete cost analysis, for this is the proper method for securing industrial business.

(6) Have the industrial sales engineers identified with various engineering societies. It will pay big dividends for the money expended.

(7) Deal fairly with the industrial gas appliance manufacturer. We need his assistance in our industrial heating problems and he should be given every encouragement to develop better gas burning equipment.

(8) Build and keep up a reliable mailing list of your present and prospective customers. Your list should include technical libraries, engineering societies, technical high schools, colleges, etc. In other words, literature like the "Industrial Gas" magazine should not only be in the hands of men in the industries, but on the reading tables of technical libraries and engineering societies.

(9) A nominal salary should be paid the young engineer the first year. If he demonstrates his ability to do things, the proper compensation should be made in order to retain him.

(10) Remember the industrial gas business requires study, hard work and perseverance. It is worth the effort, however, for, after all, it is profitable business.

*Utility Advertising

Its value and the answer to who pays the bill

John H. Hartog

THE question is often asked: "Who pays for all your advertising?"

"Does the customer?" "Is it not added on to the price and thus in reality paid for by the public?" Not always. Not generally, in fact.

There are certain fixed overheads which are just the same whether 50 per cent or 100 per cent or 150 per cent of normal business is done. Think of the salaries, the store rent, the office rent, the janitor, lights, 'phone, heat, taxes, charities and donations, breakage, stealage, rottage, leakage and what not.

To get a quick slant on this question, let us suppose this fixed monthly overhead is $1,000.

And say we sell 1,000 units in a month. Cost per unit, $1—for overhead.

Now we advertise and increase our sales, say, 50 per cent. We sell 1,500 units. The advertising was, say, $100. Total expense, $1,100, divided by the 1,500 units sold, is less than 70 cents per unit instead of the $1.

Who paid the $100 worth of advertising? Is it not a fact that the dealer either made 30 cents more per unit or gave the public the benefit of the 30 cents, or at least a part or lion's share of the 30 cents saved?

If the $100 spent in advertising had not increased the sales, then the $100 would have come out of the advertiser, that's true. But good advertising always increases sales. If it does not, it isn't good.

Why Utilities Should Advertise

Should a public utility advertise? Yes, indeed. For two reasons—first, to sell more, and secondly, to serve better.

What has advertising to do with service? Much every way.

First, by putting yourself on record as being a servant, you've got to serve.

Secondly, by drawing closer to the reading public (and that means the intelligent part of it, the part most worth while), you make them feel more friendly. Because they feel friendly, you will try and maintain that desirable attitude.

Thirdly, as the public likes you more, you will be in better frame of mind to respond. Love cannot come from one side only. It takes two to quarrel, it is said, but it takes two to love, and the kind words the public says about you urge you to make yourself worthy of a continuance of this appreciation.

Advertising Helps Sell Goods

The other reason for advertising, namely to sell more goods, should be well considered. If the Portland Gas & Coke Co. had not established a rate of 50 cents net per thousand cubic feet for wholesale use of gas in househeating, it would not have been able to reduce the domestic gas rate to a dollar. And the 50 cent rate would not have produced results if we had not advertised our gas furnaces and the advantages of gas, as fuel. More advertising, more appliances. More appliances, more gas. More gas, less cost. Less cost, lower rates to the public.

One of the most striking instances of the above is our briquet business in Portland.

Two years ago, when oil went down, we decided to drop the price on briquets from $19 to $15.75 per ton and advertise persistently. The result was such a demand that we could not fill all orders.

Selling Fuel in Summer

To meet the expense and congestion caused by the usual fall rush, it was decided to try to sell briquets in summer at a dollar discount. Advertising was resorted to again. Not a dollar was spent for solicitors, salesmen, circulars (except bill-stickers), booklets or signboards, and the orders just thrilled in over the wires! And all at a cost of about 14 cents per ton, or less than 1 per cent. On, say, 50,000 tons that would be $6,000. We spent that and gave the public a discount of $28,000 that year on the summer deliveries, $23,000 last year and $19,000 this year, at a dollar per ton. We were better off ourselves, the crews were kept intact, the factory kept going and the accumulated mountain of lampblack was disposed of. The sales are watched day by day and the advertising applied only as needed. At first the cost of the ads is not considered. Cost means nothing when there is a purpose to accomplish. That purpose is to start the momentum. Once it has gained a little headway, the extra fuel is not needed except as one gets into the low spots and has to climb up again. It is a charming, a fascinating game, this holding back or letting out the dogs of war, the display ads, to keep the sales at a certain ratio. The joy of seeing the response outweighs most other pleasures.

All Are Benefited

If this success in selling fuel at a time when people commence to think of fishing and seashore, is not a tribute to newspaper advertising, then there never was any. The public, the company, the newspapers, the employees, all are benefited.

And who paid the bill? There wasn't any. It ceased to function as a bill. It was swallowed up in the benefits accrued.

This seeming paradox is simply the natural consequence of the law of co-operation. Antagonism, inharmony and hatred beget waste and losses. Co-operation, harmony, pulling together and love beget economy and results.

———* The above is an extract from an address on Advertising delivered by John H. Hartog before the New Business Division of the Portland Gas & Coke Co.'s Educational Course furnished to its employees

Current Market Prices

COALS (By Courtesy of Coal Age)

A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.35 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	2.00 to 2.25
Kanawha mine run	Columbus	1.30 to 1.55
West Virginia lump	Cincinnati	1.85 to 2.25
W. Virginia gas mine run	Cincinnati	1.40 to 1.60
Midwest		
Indiana 4th vein lump	Chicago	2.75 to 3.00
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	3.30 to 3.50
Big Seam mine run	Birmingham	1.50 to 2.00
Southeast Kentucky lump	Louisville	2.50 to 2.75
Southeast Kentucky mine run	Louisville	1.50 to 2.00

B. Anthracite.

(Spot prices F. O. B. mines, gross tons).

	Freight rates	Independent	Company
Egg New York	$2.34	$8.50 to $13.00	$8.00 to $8.35
Egg Philadelphia	2.39	9.25 to 11.00	8.10 to 8.35
Egg Chicago (net tons)	5.06	8.50 to 12.00	7.25 to 7.45

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$3.00
Wise County, furnace	$4.50 to 5.00
Alabama, furnace	4.50 to 5.00
Foundry, Newark, N. J., del	10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill	9.00
Foundry, Alabama	4.50 to 5.50

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	1.45
Corning, Ohio	1.75
Lima	1.83
Pennsylvania	$2.75 to 2.85
Wooster, Ohio	1.65
Indiana—Illinois.	
Illinois	1.62
Indiana	1.63
Oklahoma—Kansas.	
Healdton	.90
Mid-continent (low gravity)	.90 to 1.05
Gulf Coast.	
Gulf Coast, Grade A	$1.35
Gulf Coast, Grade B	1.15

GAS OILS.

Gas Oil, Bayonne, bulk gal	5¼ to 5½c
Gas Oil (32-36) Oklahoma, gal.	2⅝ to 2⅞c
Gas Oil (32-36) Gulf Coast, gal	3½ to 4

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$61.20 to $62.20
Six-inch and over, Chicago	57.20 to 59.20
Four-inch, Birmingham	56.00 to 59.00
Six-inch and over, Birmingham	52.00 to 53.00
Four-inch, New York	69.60 to 71.60
Six-inch and over, New York	64.60 to 65.60
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb	5 to 5¼c
Ammonia aqua, 20 deg. drums lb	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb	30 to 36 c
Ammonium sulphate, bulk F. O. B. Works, per 100 lbs	$2.60 to $2.65
Potash prussiate, yellow casks, lb	18½ to 19 c
Potash prussiate, red casks, lb	37½ to 40 c
Soda prussiate, yellow casks	10 to 10½c
Soda sulphocyanide, barrels, lb	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

Benzol C. P. tanks, works, gal	24 to 25c
Benzol, drums, gal	30c
Benzol, 90% tanks, works, gal	23c
Benzol, 90% drums, gal	28c
Napthalene, flake, barrels, lb	4½ to 5 c
Napthalene, dyestuff bags, lb	4½ to 5 c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal	29 to 30c
Toluene, C. P. tanks, works, gal	31c
Toluene C. P. drums, works, gal	36c

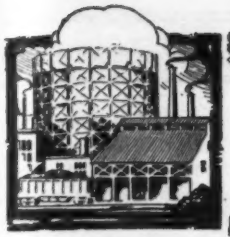
COAL

The Bureau of Mines of the Department of the Interior reported that the production of gas and fuel oils in California during July was 365,434,975 gallons, a decrease during the month of 4,498,815 gallons. Stocks also showed a decrease, holdings at refineries at the close of July amounting to 804,160,352 gallons.

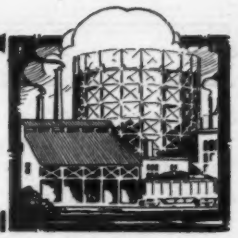
Production of fuel and gas oil at the 141 inland refineries reporting to the Western Petroleum Refiners Association for the week ended August 15, totaled 31,239,535 gallons, a drop of 1,224,460 gallons from the output for the previous week. Stocks of gas and fuel oils on hand at those refineries on August 16 totaled 111,013,764 gallons, an increase of 341,332 gallons over holdings at the close of the previous week.

CRUDE OIL

Principal increases in the output during the week ended August 23 were in Oklahoma, which showed a gain of 24,650 barrels a day, and Central Texas, up 3,050 barrels daily. Production in the Wyoming, Montana and Colorado fields dropped off 6,600 barrels to 119,700 barrels a day, and California lost 4,750 barrels, falling off to 613,700 barrels daily. Production in the Southern California fields for the week was 326,000 barrels, a loss of 50.8 per cent from peak attained during the week ended August 15, 1923, with a daily output of 663,000 barrels. Production for all California for the week was 613,700 barrels, a decline of 29.6 per cent from peak production for the state scored during the week ended August 18, 1923, with 872,000 barrels.



NEWS OF THE GAS INDUSTRY



Canadian Gas Association Holds Annual Meeting

A most successful convention at Toronto

By Special Correspondent

Anyone unfortunate enough to be hindered in attending the seventeenth annual convention of the Canadian Gas Association, held at the Royal Canadian Yacht Club, Toronto Island, August 28, certainly missed a gas meeting that will go down into history, both from the record attendance and character of papers, meetings, etc.

Over two hundred members and friends of the association were in attendance from all parts of the United States, Canada and England, and to say they enjoyed it is to put it mildly.

From evidence submitted by many attending from this side of the line it would prove that no state meeting has surpassed the one just held in Canada, for from every angle could be heard expressions of appreciation of the way the Torontonians entertained and the variety provided, and that without cost to anyone, is something that will not be forgotten for many a long day.

The ladies seem to be right at home when attending Canadian affairs, for, as the group photograph shows, you can see them right in line and hailing from almost everywhere on this and the other side of the line.

We believe Arthur Hewitt, official toastmaster at the dinner held in the Yacht Club, where every seat was occupied, will agree with us that he, also, has not witnessed a single all-Canadian meeting where the attendance was as large, as jolly, as interested and as pleased as that just concluded.

The weather was ideal for a convention and while the ladies were free to enjoy the hospitality of the club house grounds, the gentlemen resorted to the assembly room, where President Jefferis promptly called the meeting to order with the following brief but come-again sort of an address:

"Gentlemen: Will you please come to order.

"On behalf of the officers and executive of the Canadian Gas Association, it gives me a great deal of pleasure to extend to you all a very hearty welcome to this, our seventeenth annual convention.

"It is, indeed, most gratifying to see such a large gathering here this morning. I want to especially welcome our friends from across the line and from the Old Land, and to say to them that this is one big family reunion, and we do want them to feel that they, too, are members of this family. And at the close of the convention, when the time comes for you to leave to go to your homes—some across the line, others across the ocean—we hope you will feel you are glad you came, that you will be sorry to part, and that you will want to come back again.

"I feel sure that we are going to have a very happy time. Major Humphreys and his committee have prepared a splendid list of papers for your consideration. And I think you will all agree with me when I say that Mr. Armstrong and his entertainment committee have selected an ideal spot for our meeting today."

The reading of the executive committee's and secretary-treasurer's reports followed, succeeded by the appointment of a nominating committee for election of office bearers and executives for the year 1924-25.

President C. A. Jefferis' presidential address was next in order and covered the progress of the association during the past year and touched on possibilities ahead of the Canadian gas industry. His address is published elsewhere in this Journal. President Jefferis emphasized the growing importance of the gas industry and strongly recommended local gas company executives to put forth every effort to obtain the business which, with a little patient development, was theirs almost for the asking.

A real reception was given to Mr. W. H. Earle, superintendent of gas manufacture, Rochester Gas and Electric Corporation, Rochester, N. Y., who delivered a very excellent, well illustrated paper covering recent gas manufacturing developments at Rochester. Lantern views also were used to ably describe the many improvements brought about in the Rochester plant. His paper is worthy of close study by every gas engineer.

Mrs. Ethel M. Woods, with credentials from the British Commercial Gas Association, and also commended by the American Gas Association, was a very interesting and entertaining visitor to the Canadian meeting and was introduced to the delegates at this juncture of the proceedings by Arthur Hewitt of Toronto. Mrs. Woods has been of late years interested in the better class of educational publicity for gas companies and some of the more recent splendid pieces of printed matter brought out by the British Commercial Gas Association are the product of her hands.

That the industrial fuel business is at the present time a very vital question with many gas managers was very strikingly illustrated by the interest taken in Mr. F. A. Cauley, the well-known industrial expert of the Peoples Gas Light and Coke Company of Chicago, who delivered a very encouraging paper on the industrial fuel situation.

From lantern views Mr. Cauley was able to give his audience a real idea of the extent of the industrial fuel business that had developed in Chicago during the last twenty years. It was rather startling to many of the smaller gas company representatives present to hear of installation of gas appliances consuming in one month's time what was considered a fair total annual output of some of the smaller companies. Mr. Cauley, however, emphasized the fact that such demands were not brought about all at once. In some instances big demands had eventually come through interest taken in very small installations of appliances and many years close study of factory conditions had been necessary before gas was applied on a large scale. He strongly pointed out the value of employing only graduate engineers or college men when operating an industrial department. These men could better analyze local conditions and, being students, they were at no loss to know what to do when the occasion required calculations on a scientific basis. He said smaller gas companies should not get down-hearted and feel that they could not obtain business of this kind. There was some business for every company if only an effort was made to get it.

The star attraction of the day followed the close of the morning session, it being the luncheon where everyone was a guest of the association. About two hundred delegates and their lady friends, among whom were many gas men and engineers of note, sat down to what turned out to be an almost three-hour luncheon, banquet and entertainment. Thirty prominent persons interested in various phases of gas development occupied the head table. The Mayor of Toronto, W. W. Hiltz, gave a glad hand of welcome to the association and hoped the delegates would make themselves feel right at home, and ended by saying if they saw anything they liked as they wandered around to help themselves. The Hon. T. L. Church, M. P., former Mayor of Toronto for seven consecutive years, followed with a fine address on the development of Canada's fuel resources and stated the gas industry was logically the right center for conservation of coal fuels.

Mrs. Ethel M. Woods, of the British Commercial Gas Association, spoke on the "Seven Ages of Woman," and showed the wonderful part gas could play in the development of the home.

Mr. Ormond Higman, director of the Electrical Standards Laboratories, Dominion of Canada, the father, almost, of the national movement for more sane standards respecting the B.t.u. of gas, and instrumental in bringing into force Canada's country-wide adoption of the lower calorific basis of gas manufacture, was a prominent guest at the dinner and spoke for a few minutes on this important phase of gas manufacture.

Major Alexander Forward, secretary-manager American Gas Association, also addressed the meeting, while Arthur Hewitt of Toronto did excellent service as official toastmaster. While luncheon was being served and between courses the guests whole-heartedly entered into a real chorus by singing many popular melodies accompanied by an orchestra. It did one good to hear everyone join in:

A toast to the King and to the President of the United States was given at the opening of the after-dinner speech period, accompanied by singing of "My Country 'Tis of Thee" and "God Save the King." One would never imagine that there was even an imaginary line between the two countries whose favored sons and daughters had joined together to foster greater interest in one another and for the furtherance of the gas industry.

The official photograph followed, after which the ladies to the number of about fifty took advantage of a boat trip around Toronto Island and harbor, while the men assembled for the resumption of the afternoon business.

Discussion of Mr. Cauley's paper was continued, when much additional information was brought out relative to the value of industrial business to gas companies.

Mr. W. A. Sauer, vice-president Peoples Gas Light and Coke Company, Chicago, followed with a very

educational report on the activities of the accounting section, American Gas Association. He showed how much good work had already been done educationally among the various gas companies along lines of analysis of gas company statistics, budget, customers' accounting, insurance, uniform classification of accounts, form of annual report to public service commissions. He also touched on the subjects of improving relations with customers through employees visiting customers' premises, errors, their correction and prevention, welfare systems, etc.

The first day's sessions were then brought to a close, President Jefferis advising all delegates to not forget the 2,500 voice pageant chorus at the Toronto Exhibition that night. Tickets had been provided for all as guests of the association and he hoped all would take advantage of this feature—one which they never would forget. It certainly turned out to be just what he had said and many were the favorable remarks made afterward on this wonderful chorus' work. It is not every day that one can hear two solid hours of singing by over 2,500 voices, but this opportunity afforded the guests by the association will long be appreciated by those present, some two hundred or more.

Friday morning the sessions were held in the convention hall of the Consumers' Gas Company, fourth floor, 55 Adelaide street, East Toronto. About one hundred members were on hand and promptly at 10 a. m. President Jefferis called the meeting to order and announced that a paper entitled "Machinery in the Gas Distribution Department of a Gas Company," written by E. S. Stanton, superintendent of distribution, Montreal Light, Heat and Power Company, Montreal, would be the first on the program.

Mr. Stanton's paper was a description of some of the trenching and pipe-laying machinery in use by the Montreal company. It also gave much valuable data as to costs of such equipment in operation and proved how great a saving could be attained by its use. He supplemented his paper by passing among the delegates a considerable number of excellent photographs illustrating the kind of machines in use by his company and nature of the work they could perform.

"The fact that coal gas contains about 600 heat units per cubic foot, or natural gas about 1,000 B.t.u., or coal about 12,000 B.t.u. per pound, or liquid fuel about 19,000 B.t.u. per pound, is not a conclusive index of their relative ultimate values," so declared R. O. Wynne-Roberts, C. E., of Toronto, when opening his address on "Relative Value of Fuels." "One gaseous fuel may be more efficient than another because its composition may be satisfactory, and nowadays when people were beginning to wake up to the importance of the fuel situation, the importance of knowing what various fuels would accomplish in actual practice in competition with one another, was a more vital factor than knowing what inherent heat value any one fuel contained." His paper is one worthy of close perusal by all who are concerned with the analysis of fuels. He gives a formula which is helpful in studying this question, and which aids in arriving at correct conclusions in regard to what this or what that fuel will actually do in practice.

J. S. DeHart, of the Isbell-Porter Company, was in attendance at the Canadian meeting and presented an excellent paper and illustrated description of the new manufactured gas plant of the Iroquois Gas Corporation, Buffalo, N. Y.

"A Few Remarks on the Production of Tully Gas at the Belleville Gas Works, Belleville, Ontario," is the title of a paper read by William Harden, manager of the company. Mr. Harden's remarks on how his company came to install a Tully gas unit evoked much merriment among the guests present. Lacking capital to even add any one improvement to the existing works and hearing of the possibilities of obtaining equipment for producing 45,000 cubic feet per ton of coal, made them decide to install a unit in hopes the saving would pay for the installation. In any event, they are satisfied with their venture, even if it doesn't accomplish what they had hoped for in the first place. Mr. Harden says it is sav-

ing them money and that is all he knows about it. His conclusions brought forth much applause.

Can we heat a house with gas? That was one of the first questions asked by H. E. G. Watson of Toronto, in a paper entitled "What About House Heating?" Mr. Watson said this first question sounds rather foolish, very much like foolish question number one, but it was one frequently asked, especially by people outside of the gas industry. Of course, the answer is in the affirmative. House heating has been done for years in natural gas districts, and has been done with manufactured gas successfully and extensively in Baltimore, in cities on the Pacific Coast, St. Louis, Chicago and a number of other cities. We know that the Canadian climate is no bar, because a few houses have been heated by gas in Toronto for the past ten years.

Mr. Watson brought out other questions that are frequently asked of the gas man by insiders as well as outsiders; in fact, his whole paper was one pamphlet of questions, which, as he said, were used mainly to evoke discussion of a subject which was on almost every one's mind in these days. The necessity of advertising with the end in view of educating customers to the value of gas as a house heating agent was strongly emphasized by the speaker. He also advocated a closer study of the house insulation and chimney problem, wherein lay many reasons why it was difficult to heat houses satisfactorily with gas or any other fuel. Properly constructed chimneys were the first essential to well designed house heating systems. Mr. Watson's paper, like that read by Mr. Cauley, was one of great encouragement to gas men interested in the development of industrial fuel gas.

A number of very interesting reports of representatives on various sections of the American Gas Association followed and at 1 p. m. the incoming president, E. R. Hamilton, announced the meeting adjourned, but not before one of the delegates moved a resolution that a hearty vote of thanks be tendered the Canadian Gas Association, the Consumers Gas Company and the Standard Meter Company of Toronto, for the manner in which the delegates had been entertained and for the excellent papers and program provided to all.

About 160 of the delegates and lady friends were the guests of the Standard Meter Company at the evening performance before the grand stand, Canadian National Exhibition.

Customer Ownership Committee, A. G. A., Holds Meeting

At a meeting at Association headquarters on August 20th, the Customer Ownership Committee discussed the subject of "Methods of Selling Securities to the Public" and plans were made for issuing a questionnaire to all gas companies of the country, asking them for complete information regarding their sales of securities and the specific methods used.

The information obtained by the questionnaire will be incorporated in the committee's annual report to be made public at the October convention.

Those present at the meeting were: C. A. Munroe, the Laclede Gas Light Co., St. Louis, Mo.; W. T. Biedler, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.; J. R. Fenniman, Consolidated Gas Company of New York, New York, N. Y.; H. E. Weeks, United Light & Railways Co., Davenport, Iowa; E. H. Robinette, Public Service Electric & Gas Co., Newark, N. J.; E. C. Scobell, Rochester Gas & Electric Corp., Rochester, N. Y.; C. R. Stull, the American Gas Co., Philadelphia, Pa., and K. R. Boyes, acting secretary.

New Industrial Rates for Tri-City Gas Company

Gadsden, Ala. — The Tri-City Gas Company has filed a petition with the Alabama Public Service Commission at Montgomery asking permission to establish new industrial rates, which the management states will be the lowest given manufacturers anywhere in the South.

It is proposed to put in a rate of $1.50 per 1,000 cubic feet for the first 10,000 feet, and $1 per 1,000 cubic feet for over 10,000 feet net, with a minimum charge of $15 per month. The present rate is $2.50 per 1,000 cubic feet for the first 5,000 feet, $1.75 for the next 5,000 feet, $1.50 for the next 5,000 feet and $1.25 for all over 15,000 feet. There are many large industrial consumers of gas in the Gadsden district, and this proposed new rate will be of much interest to them.

Defer Naming Gas Company Head Until September 17

Reading, Pa.—Selection of a successor to the late John H. Keppelman, president and manager of the Consumers Gas Company, will likely be deferred until the meeting of the board of directors of the parent company in Philadelphia, September 17, according to the announcement of officials. The regular meeting of the board, scheduled for August 20, officials state, will be postponed until September. In the meantime Assistant Manager Taylor will assume the managerial duties.

Utica Company Acquires Municipal Lighting System

Albany.—The Utica Gas & Electric Company and the village of Clinton have made application to the Public Service Commission for the necessary authorization to transfer to the Utica company the Clinton, N. Y., municipal lighting system for $15,000, following the special election held in that village on August 7, 1924, when the electors by a vote of 107 to 61 voted to go out of the municipal operation of its public lighting. The Utica company will make application to the Clinton trustees for the necessary franchise to distribute electricity for light, heat and power in that village.

Contracts Awarded

The Stacey Manufacturing Company, Cincinnati, Ohio, has been awarded a contract for the installation of a new gas plant at Talladega, Ala., including holder, purifiers, governors, meters, valves, yard connections, etc.

Contract for a large gas holder has been placed with the Stacey Manufacturing Company of Cincinnati, for erection at Robinson, Illinois.